

Prevalence of stress and associated changes in the personal habits of frontline healthcare workers during COVID-19 pandemic: A questionnaire based study

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Abstract

Background: Coronavirus disease (COVID-19) pandemic has spread to 198 countries, with approximately 104 million confirmed cases and 2.21 million deaths globally as of January 28. Frontline healthcare workers face a substantially higher risk of infection and death due to excessive COVID-19 exposure. The aim of the study was to assess the prevalence of stress and associated changes in the personal habits of frontline healthcare workers during COVID-19 pandemic - A questionnaire based study. **Material and Methods:** It was a cross-sectional, online survey conducted in May 2021 among FHWs who are directly involved in the triage, screening, diagnosing, and treatment of COVID-19 patients and suspects. Demographic characteristics were summarized using descriptive statistics such as frequency and percentages in case of discrete data. Data were exported from the Google Forms to Microsoft Excel spreadsheet and coded. **Result:** A total of 332 responses were received and involved in any of the COVID-19 related activities. The 332 participants from across 36 states and including union territory were included in the analysis. The majority of the participants age 25-40 years (86.45%). Male are predominant in our study (53.92%). Of the 332 participants, 81.0% (n = 269/332) were doctors and the remaining 18.9% (n = 63/332) were nurses and OT technician. Anaesthesiologist formed the major proportion (n = 145/332; 43.67%). The maximum percentage of experience were 47.59% between 1-5 years. The prevalence of FHWs with sometimes felt nervous and stress was 40.0% (118). The prevalence rates FHWs with fairly often stress was 28.14%. **Conclusion:** The frontline healthcare workers are at risk of physical and mental consequences directly as the result of providing care to patients with COVID-19. Even though there are few intervention studies, early data suggest implementation strategies to reduce the chances of infections, shorter shift lengths, and mechanisms for mental health support could reduce the morbidity and mortality amongst Frontline healthcare workers.

Keywords: COVID-19 pandemic, Prevalence of stress, Frontline healthcare workers, Questionnaire based study.

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Introduction

Coronavirus (Cov) is an enclosed virus with a huge positive-sense, single-stranded RNA genome belonging to the Coronaviridae family[1]. Human pathogenic CoVs are connected with a varied collection of breathing disorders, containing common colds, pneumonia, and bronchiolitis[2,3]. As of January 28, 2021, confirmed COVID-19 infections number over 104 million individuals worldwide, resulting in over 2.21 million deaths. More than 220 countries have reported laboratory-confirmed cases of COVID-19[4]. Stress, anxiety, and depression are some of the key challenges for psychologists, psychiatrists, and behavioral scientists globally. Among physical and mental illnesses, depression is common mental disorder in the world depression[5]. According to the World Health Organization, is one of the most common behavioral disorders associated with low mood, loss of interest, guilt and worthlessness, sleep and appetite disorders, decreased energy and decreased concentration[6]. Depression and anxiety are the most common psychiatric disorders with a prevalence of 10 to 20% in the general

population[7]. Stress is in fact an integral part of human life and is perhaps one of the most common issues in modern societies[8]. Anxiety is a disorder often associated with fear and unease and is accompanied by symptoms such as fatigue, restlessness and palpitations[9]. Nurses and physicians are affected by a variety of stressors in their workplaces because of their responsibility to provide health and treatment to patients, the National Institutes of Health (NIH) said after studying the relative prevalence of health disorders in high-stress occupations. Out of 130 jobs surveyed, nursing is ranked 27th due to mental health problems[10]. Hospital staff in charge of admitting and caring for patients with COVID-19 have been subjected to a variety of individual, and organizational stresses that have adversely affected their health and job satisfaction. Therefore, recognizing stressors, and periodic training will be an effective step towards prevention, treatment and stress reduction[11]. Stress can increase depression and anxiety, reduce job satisfaction, impair individual relationships, and even lead to suicidal thoughts. It can also reduce the effects of psychological interventions due to the reduction in concentration and decision-making skills, and by influencing the mental health professional's ability to communicate strongly with clients[12]. Due to the impact of various factors on the prevalence of stress, associated changes in the personal habits (sleep, consumption of tea/coffee, smoke, drinking of alcohol) of Hospital staff directly faced with the COVID-19 patients, and the lack of general statistics in this regard. We statistically analyzed the reported results of the collected data to provide a set of general statistics on the prevalence of stress, associated changes in the personal habits within front-line

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healthcare workers caring for COVID-19 patients, with a view to inform other related programs for reducing the complications of these disorder.

Materials and Methods

It was a cross-sectional, online survey conducted in May 2021 among FHWs who are directly involved in the triage, screening, diagnosing, and treatment of COVID-19 patients and suspects. The online questionnaire was designed on Google Forms and circulated in multiple WhatsApp groups, targeting doctors and nurses involved in triage, screening, diagnosing, and treatment of COVID-19 patients and suspects.

Inclusion criteria

Participants were either gender and age ≥ 18 ; Ability to read, understand text and communicate language; and consent to personal data processing.

Exclusion criteria

Lack of access of internet. Inability to complete an online survey. Incomplete data in any section of the questionnaire.

Study Procedures

Results

The link to the online questionnaire was circulated on November 10, 2020. A maximum of three reminders were sent in all WhatsApp groups. To limit the number of FHWs who inadvertently answer the questionnaire without being involved in COVID-19 work, a specific yes/no question confirming their work in COVID-19 was asked. Those who marked the answer as "Yes" were allowed to continue answering the questionnaire.

Statistical Analysis

Demographic characteristics were summarized using descriptive statistics such as frequency and percentages in case of discrete data. The hypothesized factors/predictors to each of these conditions, namely stress, anxiety, and depression, such as age, gender, being a doctor, years of experience, hostel/ temporary accommodation, history of mental illness, presence of comorbidities, perceived inability to distress, and employment in the government sector. Data were exported from the Google Forms to Microsoft Excel spreadsheet and coded. Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) Statistics for Windows, Version 25th.

Table 1: In which State or Union territory are you working?

Answer Choices	Response	
Andhra Pradesh	2.41%	8
Andaman & Nicobar Islands	0.00%	0
Arunachal Pradesh	0.00%	0
Assam	0.30%	1
Bihar	0.60%	2
Chhattisgarh	0.60%	2
Chandigarh	3.92%	13
Dadar & Nagar Haveli	0.00%	0
Daman & Diu	0.00%	0
Delhi	3.61%	12
Goa	1.20%	4
Gujarat	0.30%	1
Haryana	6.63%	22
Himachal Pradesh	0.30%	1
Jammu and Kashmir	0.00%	0
Jharkhand	0.60%	2
Karnataka	50.90%	169
Kerala	2.71%	9
Lakshadweep	0.00%	0
Madya Pradesh	0.30%	1
Maharashtra	1.81%	6
Manipur	0.00%	0
Meghalaya	0.00%	0
Mizoram	0.00%	0
Nagaland	0.00%	0
Orissa	0.60%	2
Punjab	0.60%	2
Pondicherry	0.30%	1
Rajasthan	1.81%	6
Sikkim	0.00%	0
Tamil Nadu	17.47%	58
Telagana	1.81%	6
Tirpur	0.00%	0
Uttaranchal	0.30%	0
Uttar Pradesh	0.30%	1
West Bengal	0.90%	3
Total		332

A total of 332 responses were received and involved in any of the COVID-19 related activities. The 332 participants from across 36 states and including union territory were included in the analysis in table 1.

Table 2: Age(years)

Answer Choices	Responses	
18-24	3.31%	11

25-40	86.45%	287
41-60	9.34%	31
>60	0.90%	3
Total	0.90	332

The demographic characteristics are summarized in table 3. The majority of the participants age 25-40 years (86.45%).

Table 3: Gender

Answer Choices	Responses	
Male	53.92%	179
Female	46.08%	153
Total	46.08%	153

In table 3, male predominance in our study (53.92%).

Table 4: Profession

Answer Choices	Responses	
Nurses	14.16%	47
OT technician	4.82%	16
Resident Doctor	18.37%	61
Physician	9.64%	32
Anesthesiologist	43.67%	145
Intensivist	7.23%	24
ENT Specialist	1.81%	6
Pulmonologist	0.30%	1
Total		332

In table 4, of the 332 participants, 81.0% (n = 269/332) were doctors and the remaining 18.9% (n = 63/332) were nurses and OT technician. Anaesthesiologist formed the major proportion (n = 145/332; 43.67%).

Table 5: Work experience

Answer Choices	Responses	
0-1 Years	14.16%	47
1-5 Years	47.59%	158
5-10 Years	21.99%	73
>10 Years	16.27%	54
Total		332

In table 5, the details regarding the experience of participants are given in TABLE5. The maximum percentage of experience were 47.59% between 1-5 years.

Table 6: Describe your hospital

Answer Choices	Responses	
Government Medical College / Hospital	56.93%	189
Private Medical College	15.36%	51
Private/ Corporate Hospital	24.70%	82
Freelancing / Independent Setup	3.01%	10
Total		332

Table7: Designation of your hospital for COVID-19 management?

Answer Choices	Responses	
Designated Covid-19 Hospital	67.47%	224
Non COVID centre	32.53%	108
Total		332

Table 8: Hours of working per day

	4-6	6-8	8-12	>12	Total
Before Covid – 19 Pandemic	8.62%	49.54%	31.38%	10.46%	325
	28	161	102	34	
During Covid -19 Pandemic	11.11%	41.05%	35.49%	12.35%	324
	36	133	115	40	

Table 9: Did you get Quarantined during this pandemic?

Answer Choices	Responses	
Yes	42.17%	140
No	57.83%	192
Total		332

Table10: During COVID-19 pandemic, how often have you felt that difficulties were piling up so high that you could not overcome them?

Answer Choices	Responses	
Never	9.15 %	27
Almost Never	14.58%	43
Sometimes	44.07%	130

Fairly Often	22.37%	66
Very Often	9.83	29
Total		295

Table 11: During COVID-19 pandemic, how often have you been angered because of things that happened which were outside of your control?

Answer Choices	Responses	
Never	7.46%	22
Almost Never	7.46%	22
Sometimes	42.71%	126
Fairly Often	27.46%	81
Very Often	14.92	44
Total		295

Table 12: During COVID-19 pandemic, how often have you felt that you were on top of things?

Answer Choices	Responses	
Never	14.92%	44
Almost Never	18.98%	56
Sometimes	39.66%	117
Fairly Often	21.69%	64
Very Often	4.75%	14
Total		295

Table 13: During COVID-19 pandemic, how often you have been able to control irritations in your life?

Answer Choices	Responses	
Never	3.73%	11
Almost Never	13.56%	40
Sometimes	48.14%	142
Fairly Often	27.12%	80
Very Often	7.46%	22
Total		295

Table 14: During COVID-19 pandemic, how often have you found that you could not cope with all the things that you had to do?

Answer Choices	Responses	
Never	10.51%	31
Almost Never	14.58%	43
Sometimes	46.78%	138
Fairly Often	21.69%	64
Very Often	6.44%	19
Total		295

Table 15: During COVID-19 pandemic, how often have you felt that things were going your way?

Answer Choices	Responses	
Never	9.83%	29
Almost Never	23.73%	70
Sometimes	45.08%	133
Fairly Often	16.61%	49
Very Often	4.75%	14
Total		295

Table 16: During COVID-19 pandemic, how often have you felt confident about your ability to handle your personal problems?

Answer Choices	Responses	
Never	5.08%	15
Almost Never	9.15	27
Sometimes	39.32%	116
Fairly Often	32.88%	97
Very Often	13.56%	40
Total		295

Table 17: During COVID-19 pandemic, how often have you felt nervous and stressed?

Answer Choices	Responses	
Never	8.81%	26
Almost Never	40.00%	118
Sometimes	28.14%	83
Fairly Often	2.03%	6
Very Often	21.02%	62
Total		295

In table 17, the prevalence of FHWs with sometimes felt nervous and stress was 40.0% (118). The prevalence rates FHWs with fairly often stress was 28.14%. The overall stress is 91.4% i.e. 269/295.

TABLE18: During COVID-19 pandemic, how often have you felt that you were unable to control important things in your life?

Answer Choices	Responses	
Never	8.47%	25
Almost Never	11.53%	34
Sometimes	41.69%	123
Fairly Often	22.03%	65
Very Often	16.27%	48
Total		295

Table 19: How often have you been upset because of COVID-19 pandemic that happened unexpectedly?

Answer Choices	Responses	
Never	3.39%	10
Almost Never	4.75%	14
Sometimes	38.31%	113
Fairly Often	29.49%	87
Very Often	24.07%	71
Total		295

Table 20: Sleeping hours

	<6	6-8	8-10	>12	Total
Before Covid – 19 Pandemic	7.25% 20	72.10% 199	20.65% 57	0.00% 0	276
During Covid -19 Pandemic	33.46% 91	49.63% 135	15.81% 43	1.10% 3	272

Table 21: Pattern of sleep cycle during COVID pandemic

Answer Choices	Responses	
Maintained	36.69%	102
Disturbed	63.31%	176
Total		278

Table 22: If disturbed sleep cycle, reasons (tick all applicable)

Answer Choices	Responses	
More Working Hours	14.03%	39
Difficulty falling asleep	27.70%	77
Feeling restless & disturbed during night	46.76%	130
Others	13.67%	38
Not applicable	28.06%	78
Total		278

Table23: During this COVID pandemic, which of the following habitual consumption according to you have changed? (Tick all applicable)

Answer Choices	Responses	
Caffeine (tea or coffee)	39.93%	111
Nicotine (Cigarette)	6.47%	18
Alcohol	11.15%	31
None	49.28%	137
Others	4.68%	13
Total		278

During the COVID-19 pandemic, habitual consumption changed such as 39.93% Caffeine (tea or coffee), 11.15% alcohol and 6.47% Nicotine (cigarette) of the participants.

Table 24: What was the reason for change in your habits? (Tick all applicable)

Answer Choices	Responses	
Availability	10.07%	28
To Relive stress	36.33%	101
Sleep Deprivation	12.59%	35
Loneliness	17.63%	49
TABLEuarantine	11.15%	31
Not applicable	44.60%	124
Total		278

Reasons for change in habit such as to relieve stress 36.33%, sleep deprivation 12.59%, loneliness 17.73%, Tableuarantine 11.15%.

Table 25: Number of cups of Caffeine (tea/ coffee) consumed per day (assuming one cup of tea/coffee to be 50ml).

Answer Choices	Responses	
Before COVID-19 pandemic	99.61%	256
during COVID-19 pandemic	99.22%	255

Table 26: Amount of Nicotine(cigarette) consumed per day (number)

Answer Choices	Responses	
before COVID-19 pandemic	100.00%	161
during COVID-19 pandemic	98.76%	159

On the other hand, 1.24% of smokers in this period have quit smoking. It is interesting to notice that the number of those who smoked more than 10 cigarettes per day has decreased by 0.5%.

Table 27 :Amount of alcohol consumed per day (ml)

Answer Choices	Responses	
before COVID-19 pandemic	100.00%	156
during COVID-19 pandemic	99.36%	155

The survey investigated the variation in alcohol intake during the COVID-19 pandemic. Data show a decrease of consumption of alcohol intake by 0.64%.

Table 28: Do you feel that you reTableuire stress relieving exercises including Yoga, music or meditation?

Answer Choices	Responses	
Yes	59.35%	165
No	9.71%	27
Maybe	17.63%	49
Currently Practicing	13.31%	37
Total		278

Table 29: Did you enrol for such exercises during this pandemic?

Answer Choices	Responses	
Yes	36.69%	102
No	63.31%	176
Total		278

Discussion

The aim of the present study was to conduct an online survey to determine the prevalence of stress associated changes in the personal habits within front-line healthcare workers caring for COVID-19 patients. Healthcare workers being on frontline in fighting the disease are at higher risk of infection. With no protective vaccine available at the time of survey, identification and isolation of Covid-19 patients is the most important step in reducing the spread of coronavirus. Added to these, following proper personal protective measures like maintaining social distancing, hand hygiene, N95 mask etc are must to avoid contracting the disease[13]. This cross-sectional survey enrolled 332 respondents and revealed a prevalence of mental health symptoms among health care workers treating patients with COVID-19 in India.

In our study, most participants were male and aged 25 to 40 years and worked in Government hospitals. In our study, the overall prevalence of stress is 91.4. The highest prevalence of stress was reported in the study of Cai, H et al[14]. with 93.7%, and the lowest prevalence was related to the study of Chokshi M et al. with 5.2%[15]. The most comprehensive study in terms of sample size was related to a research conducted by Aghili SM et al. in Iran, who reported the prevalence of stress as 64.3%, among Hospital staff dealing with the COVID-19 patients. Anxiety, depression and stress have been studied in Hospital staff treating other groups of patients[16]. For instance, in the meta-analysis performed by Costello et al., the prevalence of stress in staff caring for patients with dementia was 18.34%, and in the study of Dimitriu MC et al., the prevalence of stress in Hong Kong nurses was reported to be 8.73%[17,18]. A different piece of research conducted by Kazmi SSH et al. stated that the prevalence of stress in medical students in Saudi Arabia was 30–41%[19]. The findings of our work demonstrate a higher prevalence of behavioural disorders in Hospital staff caring for the COVID-19 patients. This indicates urgent attention and possible interventions are required by related policy-makers and authorities.

In modern societies, stress at work is an important factor to consider in the healthcare sector. Stress at workplaces raises concerns about people's mental health. Workplace stress is defined as an emotional, perceptual, behavioral, and physiological response pattern to adverse aspects of work, organization, and the workplace environment. The effect of job stress on physical and mental illness is significant[20]. Job or job-related stresses are undoubtedly one of the leading causes of mental health concerns globally. High levels of stress can impair employees' performance as well as negatively affect their attitudes and behaviours[21]. Additionally, occupational stress has been shown to impose a cost of 300 to 400 million dollars on healthcare systems[22]. For this reason, identifying the causes and the prevalence of workplace stress among Hospital staff caring for the COVID-19 patients is important, and can help to protect and safeguard the workforce as well as to improve the quality of service provided to patients.

Personal habits of frontline healthcare workers

In our study, prevalence of sleep disturbances among frontline Healthcare Workers and experience poor quality sleep and develop psychological issues. Xiao et al surveyed 180 medical staff members on social support and sleep quality to determine the effects of COVID-19. The authors found that social support correlated significantly with both self-efficacy and quality of sleep. Anxiety and stress were significantly associated, leading to negative impacts on both self-efficacy and sleep. The authors recommended HCWs to take advantage of support systems, including family and friends to stabilize emotions, share experiences, and maintain social connections, thus reducing fear intensities and enabling quality sleep[23]. Furthermore, Zhang W et al found that medical HCWs had higher levels of insomnia, somatization, and obsessive-compulsive symptoms compared to non-medical HCWs in 2182 respondents in China. Insomnia risk factors included lower levels of education, working in a unit with isolation, being a physician, lack of support,

having high levels of uncertainty, and being worried about infection. The authors called for interventions for insomnia for HCWs[24].

On the other hand, in our study, 1.24% of smokers in this period have quit smoking. It is interesting to notice that the number of those who smoked more than 10 cigarettes per day has decreased by 0.5%. This phenomenon could be explained by the fear induced in smokers of the increased risk of respiratory distress and mortality from COVID-19. Smoking impairs lung function making it harder for the body to fight off coronaviruses and other respiratory diseases[25]. However, tobacco smokers (cigarettes, water pipes, bidis, cigars, heated tobacco products) may be more vulnerable to contracting COVID-19, as the act of smoking involves contact of fingers (and possibly contaminated cigarettes) with the lips, which increases the possibility of transmission of viruses from hand to mouth. Smoking water pipes, also known as shisha or hookah, often involves the sharing of mouth pieces and hoses, which could facilitate the transmission of the COVID-19 virus in communal and social settings[26].

In our study, the survey investigated the variation in alcohol intake during the COVID-19 pandemic. Data show a decrease of consumption of alcohol intake by 0.64%. Given these reasons to restrict rather than enable the supply of alcohol in the covid crisis. A handful of countries did introduce temporary alcohol bans during their COVID-19 lockdowns (e.g. India, South Africa, Greenland, parts of Canada). Firstly, heavy drinking increases risk for severe lung infections (including both viral and bacterial pneumonia) and ensuing respiratory problems[27]. Secondly, there are many reports of domestic violence spiking around the world as people are required to spend long hours together in their homes. Alcohol use increases the risk that interpersonal conflicts will result in violent behaviour. Alcohol use in the home may also compromise children's welfare[28]. Alcohol is a significant risk factor for depression and suicide, which may be more prevalent during this time of enforced social isolation[29]. Finally, it is implausible that being impaired with alcohol will do anything other than make it harder for people to attend to basic precautions for avoiding infection, such as physical distancing, hand washing and not touching one's face[30].

The results of this study show that the prevalence of stress and disturbances of habits in the Hospital staff caring for the COVID-19 patients is high. Our work has also discussed the importance of treating these disorders and their potential impact on all aspects of a medical worker's life. Therefore, interventions are necessary to improve such workers' lifestyles, through regular monitoring of potential stress disorders and personal habits, and to reduce the associated side effects. In addition, since stress can be prevented in the first place, and can also be controlled and treated if they advance, it is necessary to offer full training to Hospital staff on depression, anxiety and stress, and how they could be prevented. Moreover, it is essential to control and treat these disorders as early as possible, and through timely diagnosis.

Protective Measure

Routine protective measures against Covid-19 mainly includes wearing N95 mask, face shield and hand hygiene where the Health care worker should clean their hands using soap and water for at least 20 seconds or disinfect their hands with a 60–95% alcohol-based disinfectant. Added to these gloves, PPE kits, Googles and shoe cover needs to be used while engaging in aerosol generating procedures and interacting with Covid-19 patients. Majority of the respondents had received training on cleanliness and were well-informed about hand hygiene and protective wearables to prevent the transfer of infection.

Strengths of study

The high number of studies during the COVID-19 pandemic within a short period is impressive given the understandable difficulties in conducting research in FHWs under often stressful circumstances. Most studies used validated tools for identifying psychological stressors, although some used novel questionnaires. The implications of this study highlight a level of stress impacts and multiple factors contributing at different levels affecting FHWs when responding to

epidemics. There was a high degree of consistency in findings making it generalizable to a variety of health-related disasters. This can inform research priorities and development of measures against the deleterious mental health outcomes of the COVID-19 pandemic.

Limitations of study

The majority of study used online survey methodology and self-report measures which have inherent limitations. There was a lack of longitudinal studies and therefore little evidence on the long-term stress sequelae and treatment needs. There is a lack of in-depth research considering the pre- and post-outbreak psychological risk factors, the effects of stigma and discrimination or impact on families. Of note, it was difficult to compare studies due to heterogeneity of design and outcome measures. Geographic factors may have influenced results due to unique social and cultural contexts amongst the study locations where research was conducted.

Conclusion

Health care workers are at risk for developing physical and mental health consequences due to their role in providing care to patients with COVID-19. Implementation of the following strategies may help reduce the burden of health consequences: the adequate provision and training on the use of personal protective equipment, strict infection control practices, shorter shift length, and provision of mental health and support services.

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